United States Department of Agriculture | Forest Service | Southwestern Region | 517 Gold Avenue SW. Albuquerque, NM 87102-0084

Reply to: 3420 Date: February 8, 1989

Subject: Western Spruce Budworm Biological Evaluation, 1988

To: Forest Supervisor, Gila National Forest

On September 23, Forest Pest Management (FPM) Entomologist, Dayle Bennett, conducted an evaluation of defoliated mixed conifer stands on the northeast side of Mangas Mountain, Quemado Ranger District (RD). These defoliated stands, totaling about 1,640 acres, were delineated during our annual forest pest aerial detection survey conducted over the Gila National Forest (NF) on August 8 through 10 (see our letter dated August 24, 1988). At the time, we suspected the defoliation was caused by western spruce budworm (WSB) and scheduled a follow-up evaluation of the area. The purpose of this follow-up evaluation was to verify WSB as the cause of defoliation, determine the intensity of current year's defoliation, assess the WSB density through egg mass sampling in order to predict location of defoliation and intensity levels for 1989, predict potential for WSB outbreaks and subsequent damage through susceptibility factors and hazard ratings, and provide recommendations.

During this evaluation, Dayle made observations and collected data from four sites within the infestation area (see enclosed figure). These observations verified WSB as the cause of defoliation. Defoliation, particularly in the understory, was much more severe than was estimated from aerial surveys. It appeared that this defoliation has occurred for the past three to four years.

A shown in Table 1, WSB egg mass densities ranged from 23.6 to 40.3 per meter square of foliage with a mean average of 33.3 (S.E. = 3.6). Based on past experience and barring any climatic extremes, this high density indicates defoliation will occur throughout these same areas again next year. The area of defoliation probably will spread to surrounding host type. Defoliation levels will remain high, depending upon variation in WSB densities and individual stand conditions.

Based on the stand susceptibility rating system as described in Chapter 50 of FSH 2409.26a, Cutting Methods Handbook, stand conditions at sites sampled during this evaluation indicate low to moderate susceptibility ratings. However, since heavy defoliation and some top-killing have already occurred, it appears this generalized rating system may be underpredicting these particular stand susceptibilities. One reason for this discrepancy between predicted and actual damage is that the outbreak may have developed in nearby unsampled stands of uneven-aged, overstocked Douglas-fir and white fir, then spread out to the less susceptible stands that were sampled.

At any rate, certain individual susceptibility factors within these stands, such as species composition, density, height-class structure, vigor and maturity are at the susceptible end of the indexing scale and are, no doubt, contributing to the current outbreak. If left unaltered, these stand factors will continue to contribute to future outbreaks and resultant damages.

Since many of susceptibility factors can be modified through silvicultural treatments, we recommend you continue your efforts to identify and silviculturally treat stands where WSB damages may adversely impact management objectives. Treatments should be aimed at reducing the percentage of Douglas-fir and white fir within a stand, striving for even-aged management, and lowering stand age and relative stand densities. We specifically encourage you to aggressively thin those residual stands of overstocked Douglas-fir and white fir advanced regeneration, in which the ponderosa pine overstory has been or is currently being removed.

We will continue to monitor and report on the status of WSB activity on Mangas Mountain and across the Gila NF through aerial and ground surveys, and recommend you notify us of any new areas of defoliation detected by your field personnel.

Douglas L. Parker

DOUGLAS L. PARKER
Director of Forest Pest Management

Enclosures (2)

WESTERN SPRUCE BUDWORM EGG MASS DENSITY AND STAND CONDITIONS
Gila National Forest, 1988

Site No.	Overstory Damage 1/	Understory Damage 1/	Current Year's Defoliation 2/	Total Years Defoliated	Stand Structure	Species Composition 3/	Habitat Type 4/	Hazard Rating 5/	Egg Mass Density M^2	Remarks
1	Medium	Heavy	Heavy	3	Two story	PP 50%, DF 50%	PSME/ BERE	Low	37.1	Actively Logging
2	None	Heavy	Heavy	3	Two-story	PP, DF	PSME/ FEAR	Low	40.3	Overstory is PP; Understory is over-stocked 20'-40' DF
3	Light	Medium	Medium	3	Uneven-aged	DF, WF, PP, WP	ABCO/ QUGA	Mod	23.6	
4	Just Logged	Heavy	Heavy	4	Was multi-storied; single, now	DF, PP	PSME/ QUGA	Mod	32.2	Advanced regeneration is overstocked

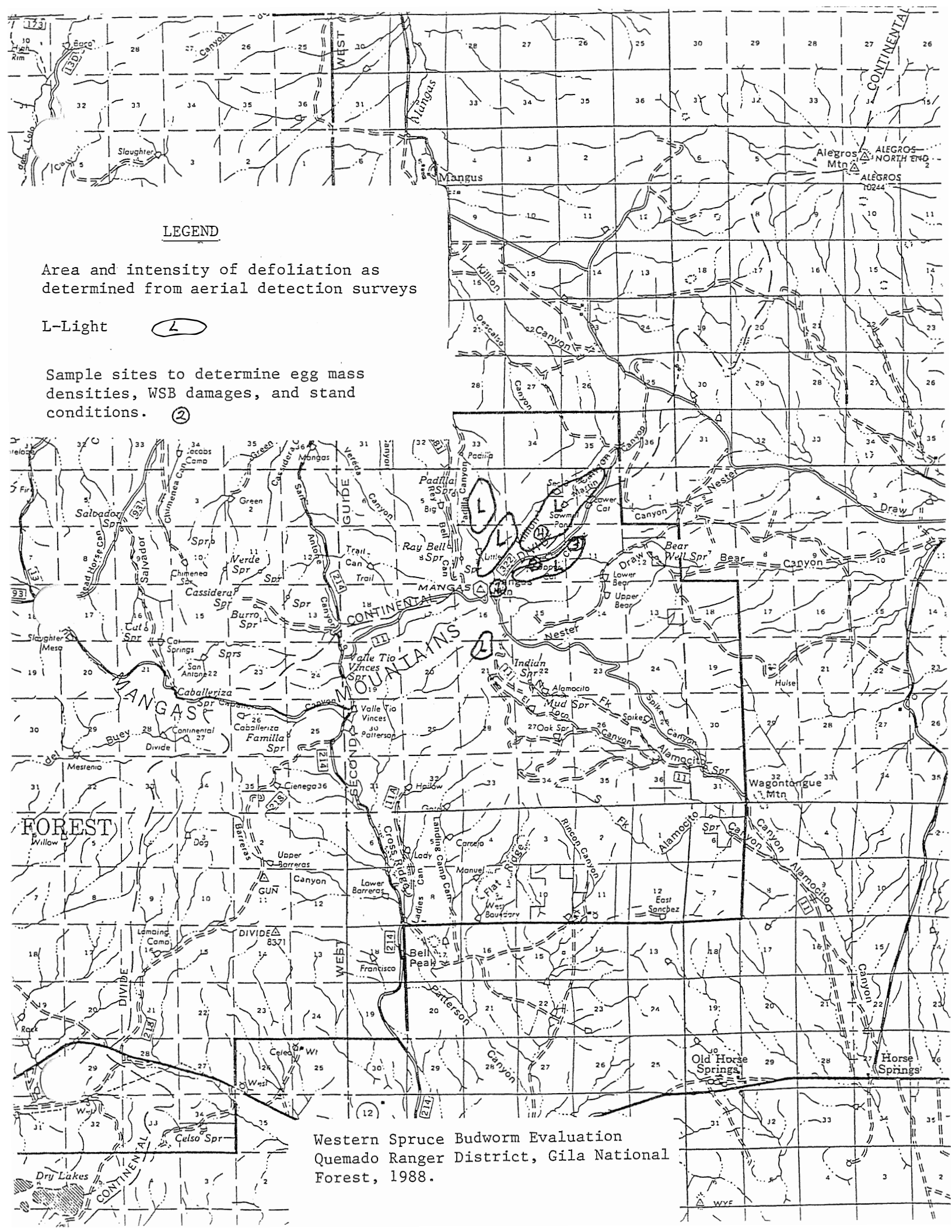
1/ Overstory and understory damage codes: Light = < 50% cummulative defoliation, no apparent top-kill or mortality; medium = > 50% cummulative defoliation and some apparent top-kill and/or mortality.

2/ Current year's defoliation codes: Light = 5 to 25% defoliation; medium = 26 to 65% defoliation; and heavy = 66 to 100% defoliation.

3/ Species are listed in descending order of occurrence in stand. Codes are: DF = Douglas-fir, PP = Ponderosa pine, WF = white fir, BS = blue spruce, WP = southwestern pine, A = aspen, and oak = oak sp.

4/ Forest and woodland habitat types (plant associations) of southern New Mexico and central Arizona (north of the Mogollon Rim). USDA-FS, Southwestern Region. 77 p.

5/ Hazard ratings determined in accordance with procedures described in FSH 2409.26a, Cutting Methods Handbook.



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Quemado Ranger District, Gila National Forest, 1988.